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ABSTRACT

The relationship between the National League for Nursing (NLN) achievement test scores and performance on the State Board Test Pool Examination (SBTPE) was studied with 166 graduates of a diploma degree school of nursing between 1976 and 1978. It was found that NLN achievement test scores had a highly significant correlation with SBTPE results. The best overall predictor on all but one part of the SBTPE was the Nursing Care of Patients II achievement test. The exception was the Psychiatric Nursing SBTPE on which the Obstetric Nursing achievement test had the highest relationship. In addition to the Psychiatric Nursing section of the SBTPE, there are four other examinations: Medical Nursing, Surgical Nursing, Obstetric Nursing, and Nursing of Children. The obstetric, nursing of children, and psychiatric NLN achievement tests were administered to the students at the end of the respective courses. Additionally, Nursing Care of Patients I, II, and III were written by students in one of their last three 11-week courses before graduation, administered by faculty, and scored by the NLN. It is recommended that the NLN achievement tests continue to be given to all students in schools of nursing to identify weaknesses to their students and hopefully to provide a review of that area before the writing of the SBTPE. Additional recommendations include suggestions for future research. A literature review and a bibliography are included. (SW)

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RELATIONSHIP OF ACHIEVEMENT TEST SCORES AND STATE BOARD PERFORMANCE IN A DIPLOMA NURSING PROGRAM

by

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CHAPTER I

INTRODUCTION

The history of the State Board Test Pool Examination (SBTPE) dates back to 1933 when, through an agreement with the American Nurses' Association, the National League of Nursing Education "accepted responsibility for advisory services to the State Board of Nurse Examiners in all educational matters including examinations." (McManus:6)* Since the development of a national State Board examination by this organization in 1944, schools of nursing have been in constant search of a variable which will predict success or failure on this examination. A minimum score on the test is required by all states for nurses to be legally employed as R.N.'s. Therefore, satisfactory performance on the examination, while not being the sole objective, is one of the major objectives of schools of nursing. Both admission committees and faculties, as well as students, of nursing schools are concerned with the writing of this licensing examination.

With the present demand for nurses any failure on the SBTPE, which could have been predicted is uneconomical both for the candidate and the nursing shortage. The use of a good predictor may be able to help potential marginal students strengthen their knowledge in a particular area prior to writing the SBTPE, thereby preventing a delay of entrance into the

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*Names in the parentheses refer to the bibliography; numbers after the colon are the page numbers.

nursing profession.

This study arose from the desire of a northern Indiana diploma school of nursing to identify a factor which would indeed predict performance on the SBTPE. National League for Nursing (NLN) achievement tests, which were given to all students throughout their nursing program were chosen as the variables to be tested for their predictability in relation to the SBTPE.

STATEMENT OF THE PROBLEM

This study will attempt to validate the statement that National League for Nursing achievement test scores are a predictor of performance on the State Board Test Pool Examination, by students graduating from a diploma nursing program.

HYPOTHESES

The following are the thirty null hypotheses which were tested:

1. There will be no statistically significant relationship between the NLN Nursing Care of Patients I achievement test score and the Medical Nursing SBTPE score.
2. There will be no statistically significant relationship between the NLN Nursing Care of Patients I achievement test score and the Surgical Nursing SBTPE score.
3. There will be no statistically significant relationship between the NLN Nursing Care of Patients I achievement test score and the Obstetric Nursing SBTPE score.

4. There will be no statistically significant relationship between the NLN Nursing Care of Patients I and the Psychiatric Nursing SBTPE score.

5. There will be no statistically significant relationship between the NLN Nursing Care of Patients I achievement test score and the Nursing of Children SBTPE score.

6. There will be no statistically significant relationship between the NLN Nursing Care of Patients II achievement test score and the Medical Nursing SBTPE score.

7. There will be no statistically significant relationship between the NLN Nursing Care of Patients II achievement test score and the Surgical Nursing SBTPE score.

8. There will be no statistically significant relationship between the NLN Nursing Care of Patients II achievement test score and the Obstetric Nursing SBTPE score.

9. There will be no statistically significant relationship between the NLN Nursing Care of Patients II achievement test score and the Psychiatric Nursing SBTPE score.

10. There will be no statistically significant relationship between the NLN Nursing Care of Patients II achievement test score and the Nursing of Children SBTPE score.

11. There will be no statistically significant relationship between the NLN Nursing Care of Patients III achievement test score and the Medical Nursing SBTPE score.

12. There will be no statistically significant relationship between the NLN Nursing Care of Patients III achievement test

score and the Surgical Nursing SBTPE score.

13. There will be no statistically significant relationship between the NLN Nursing Care of Patients III achievement test score and the Obstetric Nursing SBTPE score.

14. There will be no statistically significant relationship between the NLN Nursing Care of Patients III achievement test score and the Psychiatric Nursing SBTPE score.

15. There will be no statistically significant relationship between the NLN Nursing Care of Patients III achievement test score and the Nursing of Children SBTPE score.

16. There will be no statistically significant relationship between the NLN Obstetric Nursing achievement test score and the Medical Nursing SBTPE score.

17. There will be no statistically significant relationship between the NLN Obstetric Nursing achievement test score and the Surgical Nursing SBTPE score.

18. There will be no statistically significant relationship between the NLN Obstetric Nursing achievement test score and the Obstetric Nursing SBTPE score.

19. There will be no statistically significant relationship between the NLN Obstetric Nursing achievement test score and the Psychiatric Nursing SBTPE score.

20. There will be no statistically significant relationship between the NLN Obstetric Nursing achievement test score and the Nursing of Children SBTPE score.

21. There will be no statistically significant relationship between the NLN Psychiatric Nursing achievement test score and the Medical Nursing SBTPE score.

22. There will be no statistically significant relationship between the NLN Psychiatric Nursing achievement test score and the Surgical Nursing SBTPE score.

23. There will be no statistically significant relationship between the NLN Psychiatric Nursing achievement test score and the Obstetric Nursing SBTPE score.

24. There will be no statistically significant relationship between the NLN Psychiatric Nursing achievement test score and the Psychiatric Nursing SBTPE score.

25. There will be no statistically significant relationship between the NLN Psychiatric Nursing achievement test score and the Nursing of Children SBTPE score.

26. There will be no statistically significant relationship between the NLN Nursing of Children achievement test score and the Medical Nursing SBTPE score.

27. There will be no statistically significant relationship between the NLN Nursing of Children achievement test score and the Surgical Nursing SBTPE score.

28. There will be no statistically significant relationship between the NLN Nursing of Children achievement test score and the Obstetric Nursing SBTPE score.

29. There will be no statistically significant relationship between the NLN Nursing of Children achievement test score

and the Psychiatric Nursing SBTPE score.

30. There will be no statistically significant relationship between the NLN Nursing of Children achievement test score and the Nursing of Children SBTPE score.

DEFINITION OF TERMS

The terms used in the description of this study, which may need some clarification, are defined as follows:

Clinical: Laboratory practice which coincides with specific theoretical content, and takes place in a hospital or a related health agency.

Course: The organized subject matter and related activities, including laboratory experiences, planned to achieve specific objectives and offered within a given time period. (NLN:21).

Diploma Nursing Program: This type of school is under the control of a hospital or in some instances independently incorporated. The diploma program serves the interests and goals of qualified applicants who desire an education in a program that is primarily centered in a hospital, and who want early and continuous opportunity to be with patients and with other health personnel. The graduates of diploma programs are eligible to take the examination leading to licensure as a registered nurse. (NLN (1976):1).

National League for Nursing (NLN) Achievement Tests: A battery of tests developed for specific content areas by the NLN. These are intended to help the users of the examination

to evaluate the effectiveness with which they are meeting the objectives of similar educational programs as defined by representatives of those programs throughout the country. (NLN (1979):2)

Registered Nurse (R.N.): A nurse who has met the licensing requirements of an individual state: graduation from a licensed school of nursing, and successful completion of the SBTPE.

State Board Test Pool Examination (SBTPE): Examination with national distribution, which is given on two dates each year which are the same in all states. The responsibility for establishing the passing grade for licensure is a state right which is determined by the individual state board examiners. (Dietz:214).

LIMITATIONS

Even though the NLN achievement tests were given in similar faculty monitored environments, one factor was not controlled for. The period of time between the taking of the NLN achievement tests and the writing of the SBTPE was not the same for all students. For example, the obstetric nursing course is taught four times a year, with each section of the class taking the NLN Obstetric Nursing achievement test upon completion of the course. Therefore, some students take this particular achievement test in October, others take it in April and all students write the SBTPE at the same time. This

time variance, between the taking of the achievement tests and the writing of the SBTPE, is also true with the Nursing Care of Patients I, II, and III and the Psychiatric Nursing achievement tests. The period of time, with these four examinations, varies from six months to two weeks before the writing of the SBTPE.

One other limitation with this study is the fact that the SBTPE's for each of the three classes were different, as this examination is changed every year. The examination results were used as they were reported to the school of nursing by the state board of nursing.

CHAPTER II

REVIEW OF RELATED LITERATURE

Since a minimum score on the SBTPE is required to practice as a registered nurse in all states, the 18% failure rate of graduates taking the examination for the first time is of concern to schools of nursing and of course their students. (ANA:37) This examination which is designed to measure minimum competency of safe nursing practice has been the subject of several studies. The literature identifies several variables which have been studied in relation to their ability to predict success or failure on the SBTPE.

Many earlier studies attempted to predict performance on the SBTPE using pre-entrance criteria such as SAT scores and personality variables. One such study conducted by Miller et al (1968) found that SAT verbal scores were the best predictors of success on all five parts of the SBTPE. In the same study they identified the student's age in months, upon entrance to the nursing school, was also a good predictor on two of the five examinations. A separate study by Backman and Steindler (1971) validated SAT verbal scores as having statistically significant predictive value for the SBTPE scores of associate degree nursing students. In another study involving pre-entrance predictor variables, Ruiz (1967) found that intelligence was significantly correlated with SBTPE scores.

Other variables which were obtained closer to graduation have been utilized for their predictive value. In a study completed by Owen and Feldhausen (1970) they noted improvement in the predictive ability by including the most student information in the predictive battery. Brandt et al (1966) conducted one such study utilizing nursing course grades, both clinical and theory. The found theory grades were useful in the prediction of SBTPE results, while clinical practice grades were correlated with SBTPE scores at a -0.08 level.

In some of the more recent reseach another variable has been investigated for its predictive ability, namely, the NLN achievement tests. These examinations are given to students in nursing school after they have received content relevant to the subject of the test. They are not designed to determine pass-fail status and are therefore not used in the grading of students.

Brandt et al (1966) utilized NLN achievement test scores in their study of the University of Washington's curriculum. They found scores on the NLN Basic Medical-Surgical test were useful in the prediction of SBTPE performance.

In another study, Papcum (1971) correlated the results of the NLN achievement tests and the SBTPE in an associate degree program. She utilized eight NLN achievement tests which she correlated with each of the five tests of the SBTPE. Papcum found the best predictor, on each of the five SBTPE's, was the NLN Maternal and Child Nursing achievement test. The

positive correlations ranged from .33 to .77. All scores were significant at the .05 level. The Medical Nursing achievement test was found to produce the lowest correlations with the total scores on NLN achievement tests. The study in itself was limited, as the population was one class of 23 students.

In a study by Bell and Martindill (1976) NLN achievement test scores were used in a slightly different fashion to study their predictive ability. This research project was a cross-validation study correlating the predicted and actual scores achieved by graduates compared with previous graduates' scores of the same Texas baccalaureate school of nursing. NLN achievement test and SBTPE scores were both utilized. One hundred and one students were involved in the study conducted between the years 1968 and 1972. They found a rather high correlation between the two sets of scores which ranged from .64 to .81. The NLN scores for the Nursing of Children and Obstetric Nursing examinations were identified to be the best indicators of performance on the SBTPE. This study indicated that regression equations can be used in the prediction of student achievement or the SBTPE. They suggested the use of the NLN tests to guide students in their preparation for the SBTPE, which could lead to an increase in the likelihood of achieving a 100% passing rate, which is one goal of schools of nursing.

A study, similar to Bell and Martindill's, by Deardorff et al (1976) developed regression equations to predict a

student's performance on the SBTPE. The scores investigated in the study were those of graduates of a midwestern associate degree nursing program between the years 1969 and 1974. They found NLN achievement test results on the Sick Children, Medical and Postpartum examinations consistently showed the best predictive ability on the SBTPE across all five years in the study. The study also looked at the differences in predictive ability of raw scores and percentile scores on the NLN achievement tests. They identified that the scores generally yielded similar predictions, but SBTPE results predicted from NLN percentile scores were higher than those predicted from raw scores, however, prediction errors are more likely to occur for extreme scores with the use of percentile scores (Deardorff:38).

Another study presented correlations between NLN achievement test scores and the SBTPE results for students in baccalaureate and diploma degree programs. The correlations in the baccalaureate programs ranged from .407 to .758, with the Medical-Surgical Nursing tests having the highest correlations. This particular study was the most impressive in terms of numbers of scores studied for diploma degree programs. Here the correlations ranged from .521 to .636, with the Medical-Surgical Nursing achievement tests again being the best predictors. The authors while presenting significant results, did not identify the level of significance for the results (Nursing Outlook:61).

Mueller and Lyman (1969) also completed a study of 65, 1967 graduates of the Jewish Hospital of Cincinnati School of Nursing. Their findings showed statistically significant relationships between all NLN achievement test scores studied and four of the SBTPE's at the .001 level. The exception was the Psychiatric Nursing SBTPE which was correlated with the NLN achievement test in Pharmacology, Maternal and Child Health and Diet Therapy and Applied Nutrition at the .01 level of significance and the remainder of the achievement tests at the .001 level. The coefficients of correlation ranged from .36 to .68.

In one final study, Baldwin et al (1968) studied NLN achievement test scores in hopes of identifying student's individual standing on factors which tend to predict state board performance. The study sought to help the student whom had received the content required for practice as a graduate to then be able to develop an effective plan for review and preparation for the SBTPE (Baldwin:170). Using a random sample of 74 students drawn from the graduating classes of a diploma school between the years 1960 and 1964, raw scores on the NLN achievement tests were studied for their relationship to SBTPE performance. They found coefficients of correlations which ranged from .42 to .54. The Basic Medical-Surgical Nursing achievement test raw score was identified to be the best predictor and the Nursing of Children examination to have the lowest coefficient of correlation in this study.

The purpose of this study was to investigate NLN achievement test scores as predictors of SBTPE performance. There have not been any studies published on this subject since 1976. With the recent changing populations in schools of nursing a more recent study was indicated and therefore undertaken.

CHAPTER III

DESIGN OF THE STUDY

SUBJECTS

The population of the study consisted of 180 students--all students graduated from a midwestern diploma school of nursing in the years 1976 to 1978 inclusive. After subjects with missing NLN achievement test scores were removed from the population the sample consisted of 166 graduates. The Psychiatric Nursing NLN achievement test was not given to 22 of these graduates, therefore, the n for the coefficients of correlation for this examination was 144. All otherdata were complete for all subjects.

The sample consisted of 163 females and 3 males. Their ages ranged from 21 to 35 years.

DATA COLLECTION

Obstetric, Nursing of Children and Psychiatric NLN achievement tests are given to students at the end of the respective courses. Nursing Care of Patients I, II and III are written by students in one of their last three 11-week courses before graduation (See Appendix 1). The tests are administered by faculty members in a controlled environment. It is a multiple choice test which is scored by the National League for Nursing. The results are reported back to the school of nursing in two forms: raw score and percentile. The raw score was used in this study as the percentile is in relation to other students taking the examination and is re-normed at frequent intervals.

The SBTPE is composed of five examinations: Medical Nursing, Surgical Nursing, Obstetric Nursing, Psychiatric Nursing and Nursing of Children. The test is administered in each state twice a year on the same dates. Strict security is maintained with the preparation and administration of this examination. Each individual test is standardized to a mean of 500 with a standard deviation of 100 and a minimum passing score of 350 in most states (Mueller:263). The scores utilized in this study were the ones reported to the school of nursing by the State Board of Nursing.

Scores were compiled for each student on all NLN achievement tests and the SBTPE. With the use of a computer, a Pearson product moment coefficient of correlation was then determined by comparing students' individual NLN achievement test scores with their score on each of the five SBTPE's. Separate coefficients of correlation, thirty in total, were derived for each set of scores.

CHAPTER IV

PRESENTATION AND ANALYSIS OF DATA

Coefficients of correlation, determined by the Pearson product moment technique for each NLN achievement test with individual parts of the SBTPE are presented in Table 1. The matrix shown here demonstrates a highly positive correlation for the relationship of each NLN achievement test score to each section of the SBTPE. All coefficients are statistically significant at the .01 level. In light of this fact, all thirty of the null hypotheses tested were rejected, ie. these data do not support the statement that there is no statistically significant relationship between NLN achievement test scores and SBTPE results.

TABLE 1

Correlations Between NLN Achievement Test Scores and State Board Test Pool Examination Results in a Diploma Program

State Board Tests	NLN Achievement Tests					
	Nsg. Care Pts.I	Nsg. Care Pts.II	Nsg. Care Pts.III	Obs. Nsg.	Psy. Nsg.	Nsg. Chil.
Medical Nursing	.55	.61	.54	.55	.42	.44
Surgical Nursing	.56	.56	.53	.56	.44	.50
Obstetric Nursing	.45	.49	.37	.45	.38	.41
Psychiatric Nursing	.48	.42	.38	.50	.44	.45
Nursing of Children	.47	.58	.49	.51	.46	.51

The correlations found in Table 1 are consistent with Mueller and Lymans results when they found statistically significant correlations between NLN achievement test scores and SBTPE performance at the .01 level. Their finding that the Medical Surgical achievement test was the best predictor is in agreement with the results in this study.

The overall best NLN achievement test predictor was the Nursing Care of Patients II (equivalent to Mecical Surgical), the only exception being the Psychiatric Nursing SBTPE where the Obstetric Nursing achievement test had the highest coefficient of correlation. This fact is in agreement with Brandt's study when they found the Medical Surgical test to be the best predictor. It is in disagreement, however, with Papcum's study in which the Maternal and Child Nursing achievement test was identified to be the best predictor of SBTPE performance and with Bell and Martindill's research where they too found the Obstetric and Nursing of Children achievement tests to be most indicative of SBTPE results.

One interesting facet of the data is that the respective NLN achievement test scores are not always the best predictor for that particular portion of the SBTPW. This same fact is true in the findings of Papcum, Brandt, Bell, Deardorff and Nursing Outlook (1970). These relationships are shown in Table 2. In examining the data there does not appear to be any constant pattern for the specific prediction of each SBTPE result. This suggests that there are many factors involved in the writing of these exams. The fact that the

Medical Surgical test was usually the best predictor may indicate an underlying knowledge of facts and principles that pertain to the four parts where it was most indicative. The fifth part, the Psychiatric Nursing SBTPE does not have the underlying medical surgical scientific principles so this may be the reason the Medical Surgical Nursing achievement tests were not the best predictor here. The reason why the Obstetric Nursing test was the best predictor for the Psychiatric Nursing SBTPE, however, can not even be speculated upon.

TABLE 2

Respective and Highest Correlations Between NLN Achievement Test Scores and SBTPE Results

State Board Tests	Highest NLN Correlation	Respective NLN Correlation
Medical Nursing	Nsg. Care Pts.II .61	Nsg. Care Pts. I .55 Nsg. Care Pts. II .61 Nsg. Care Pts. III .53
Surgical Nursing	Nsg. Care Pts. I .56 Nsg. Care Pts. II .56 Obs. Nsg. .56	Nsg. Care Pts. I .56 Nsg. Care Pts. II .56 Nsg. Care Pts. III .53
Obstetric Nursing	Nsg. Care Pts. II .49	Obs. Nsg. .45
Psychiatric Nursing	Obs. Nsg. .50	Psy. Nsg. .45
Nursing of Children	Nsg. Care Pts. II .58	Nurs. of Chil. .51

Regardless of which examination is the best for each SBTPE, the fact remains that all relationships found were statistically significant at the .01 level. The coeffieients of correlation ranged from .37 to .61. This range validates Mueller and Lyman's study in which they identified correlations between .36 and .68. It is also similar to Baldwin's range of .42 to .54. The similarities in findings in these studies validate the statement that there is consistently a statistically significant relationship between NLN achievement test scores and SBTPE performance.

CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

SUMMARY

The purpose of this study was to determine the relationship between NLN achievement test scores and the SBTPE results. This relationship was investigated in regards to the NLN achievement test's ability to predict success or failure on the SBTPE.

The sample consisted of 166 graduates of a diploma degree school of nursing between 1976 and 1978. Statistically significant relationships were found between the students performance on the NLN achievement test scores and the SBTPE results. All thirty of the null hypotheses tested were rejected at the .01 level, indicating that the NLN achievement test scores have a strong positive correlation with SBTPE results.

CONCLUSIONS

After careful examination of the results obtained from the testing of the hypotheses, two conclusions can be drawn:

1. NLN achievement test scores are a good predictor of performance on the SBTPE, by graduates of a diploma degree program.
2. The Nursing Care of Patients II is the best overall predictor on all parts of the SBTPE with the exception of the Psychiatric Nursing SBTPE on which the Obstetric Nursing achievement test had the

highest relationship.

A conclusion as to the reason why respective achievement tests i.e. Obstetric Nursing NLN achievement tests and Obstetric Nursing SBTPE, were not the best predictors of SBTPE results cannot be drawn without further study. A noteworthy point, however, is the fact that all relationships found between NLN achievement test scores and SBTPE scores were significant at at least the .01 level.

RECOMMENDATIONS

Based upon this study the following recommendations are made:

1. That the NLN achievement tests continue to be given to all students in schools of nursing so as to identify weaknesses to their students in hopes of review of that area before the writing of the SBTPE.
2. That instructors use the results of the NLN achievement tests to work individually with students in review of material before the SBTPE.
3. That the study be replicated with future graduating classes to increase the validity of the findings.
4. Repeat this study using course grades as the possible predictor so as to have more than one variable for the use of identification of SBTPE performance.
5. That the predictive value of the NLN achievement tests be studied after 1982 with the introduction of a new format for the SBTPE.

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Arrangement of Course Rotations

MEMORIAL HOSPITAL OF SOUTH BEND SCHOOL OF NURSING

CURRICULUM PLAN

LEVEL I

Term 1 (18 wks.) →	VAC.	Term 2	VAC	(18 wks.) →	VAC	Term 3 (12 wks.) →
Anatomy Chemistry Psychology Nursing I Nutrition Orient. to Nursing	2	Physiology Microbiology Sociology Nursing II Pharmacology	1		1	Med-Surg. Nsg. I

LEVEL II

Term 1 (8 wks.) →	Term 2 (8 wks.) →	VAC.	Term 3 (8 wks.) →	Term 4 (8 wks.) →
Med-Surg. Nsg. II (incl. OR-RR Nsg.)			Maternity Nsg.	Pediatric Nsg.
Maternity Nsg.	Pediatric Nsg.	2	Pediatric Nsg.	Maternity Nsg.
Pediatric Nsg.	Maternity Nsg.		Med-Surg. Nsg. II (incl. OR-RR Nsg.)	

LEVEL III

VAC	Term 1 (4 wks.) →	Term 2 (11 wks.) →	VAC
1	Med-Surg. Nsg. III and Prof. Relations	Med-Surg. Nsg. IV	1
		Psychiatric & Community Mental Health Nsg.	
		Leadership Skills	

Term 3 (11 wks.) →	Term	VAC.	4 (11 wks.) →
Leadership Skills		1	Psychiatric & Community Mental Health Nsg.
Med-Surg. Nsg. IV			Leadership Skills
Psychiatric & Community Mental Health Nsg.			Med-Surg. Nsg. IV

26.